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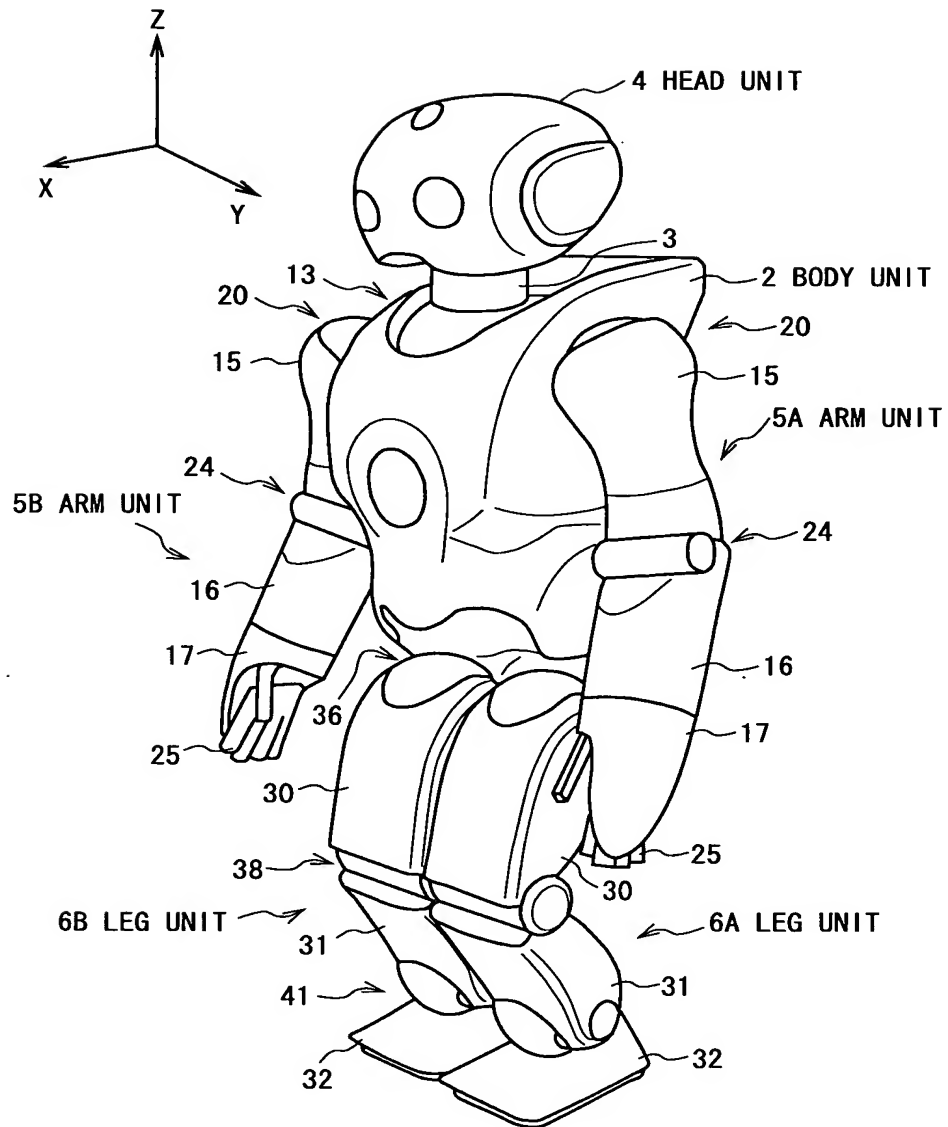
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1

FIG. 1

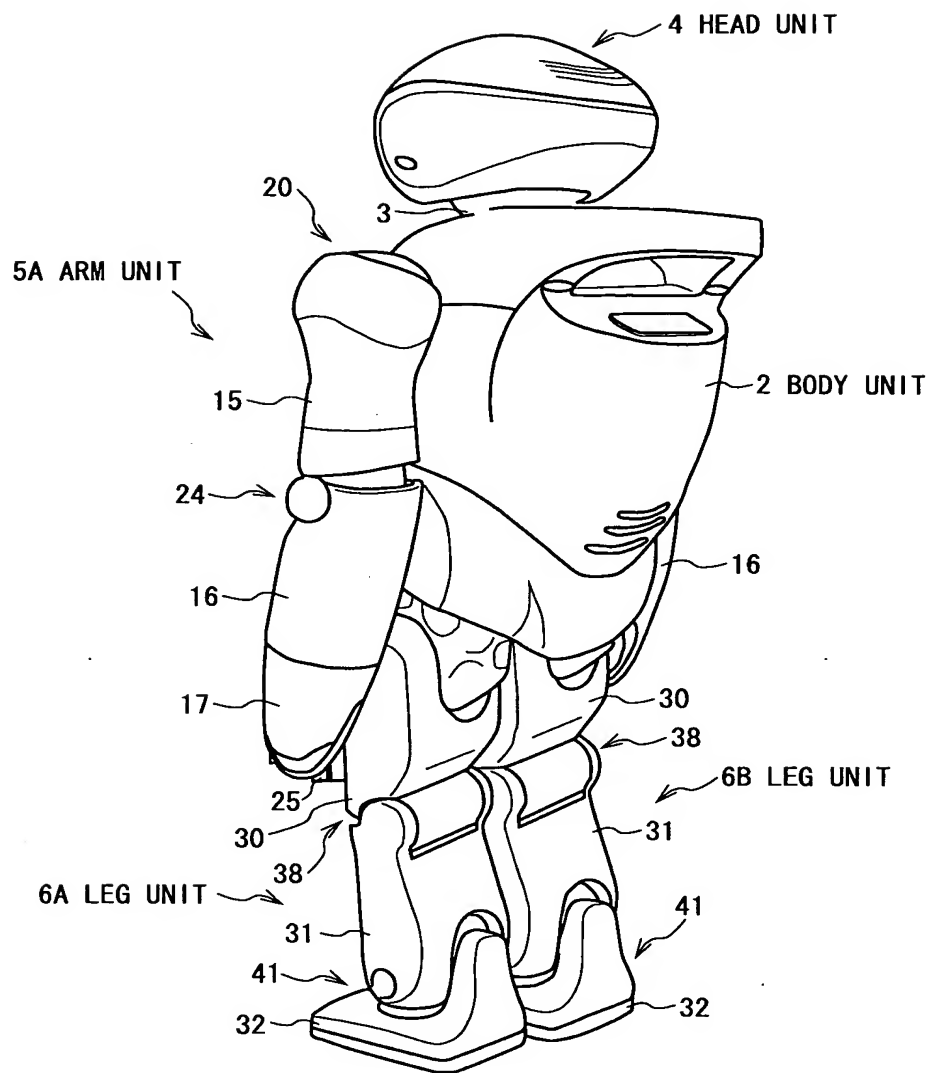


FIG. 2

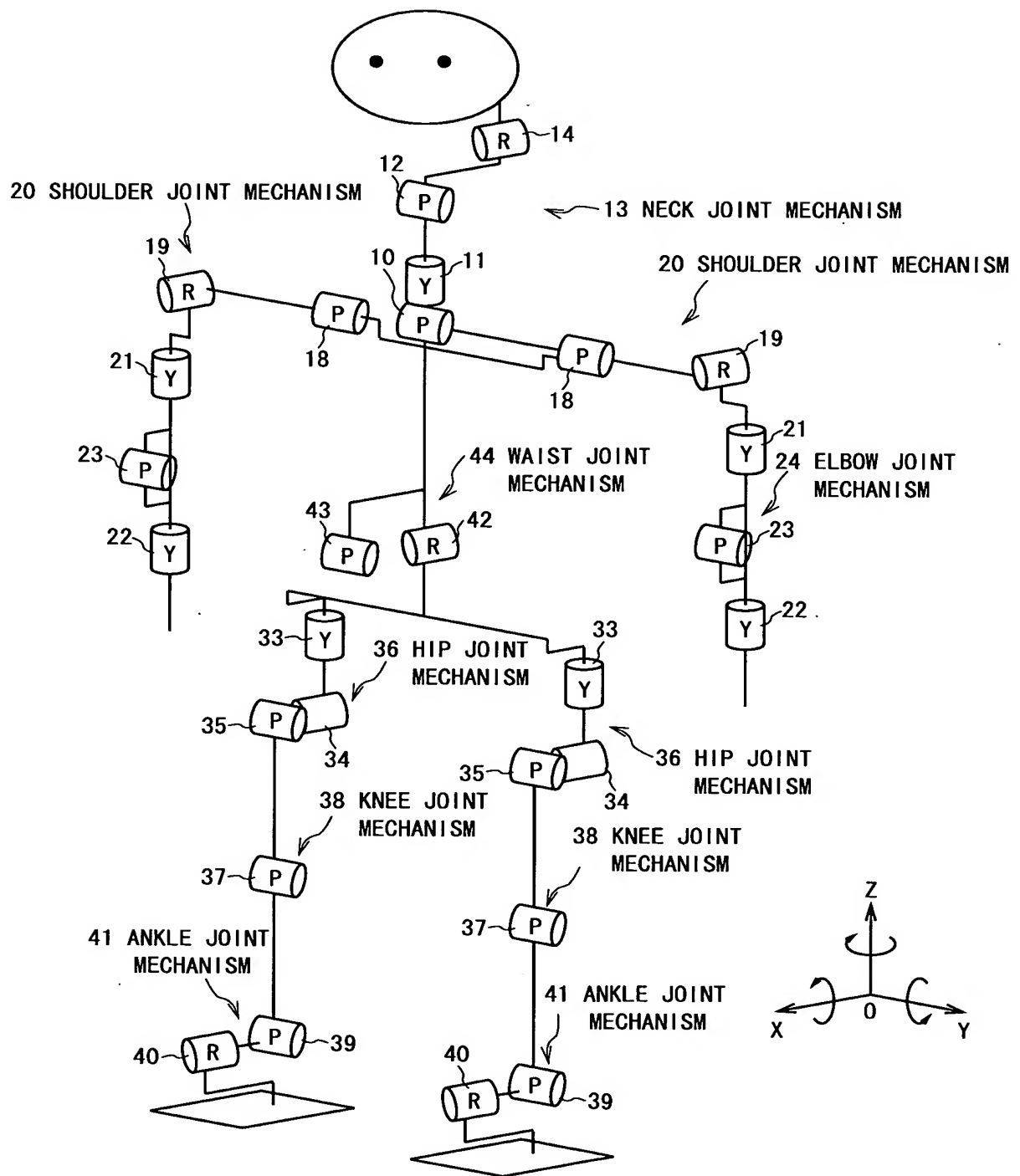


FIG. 3

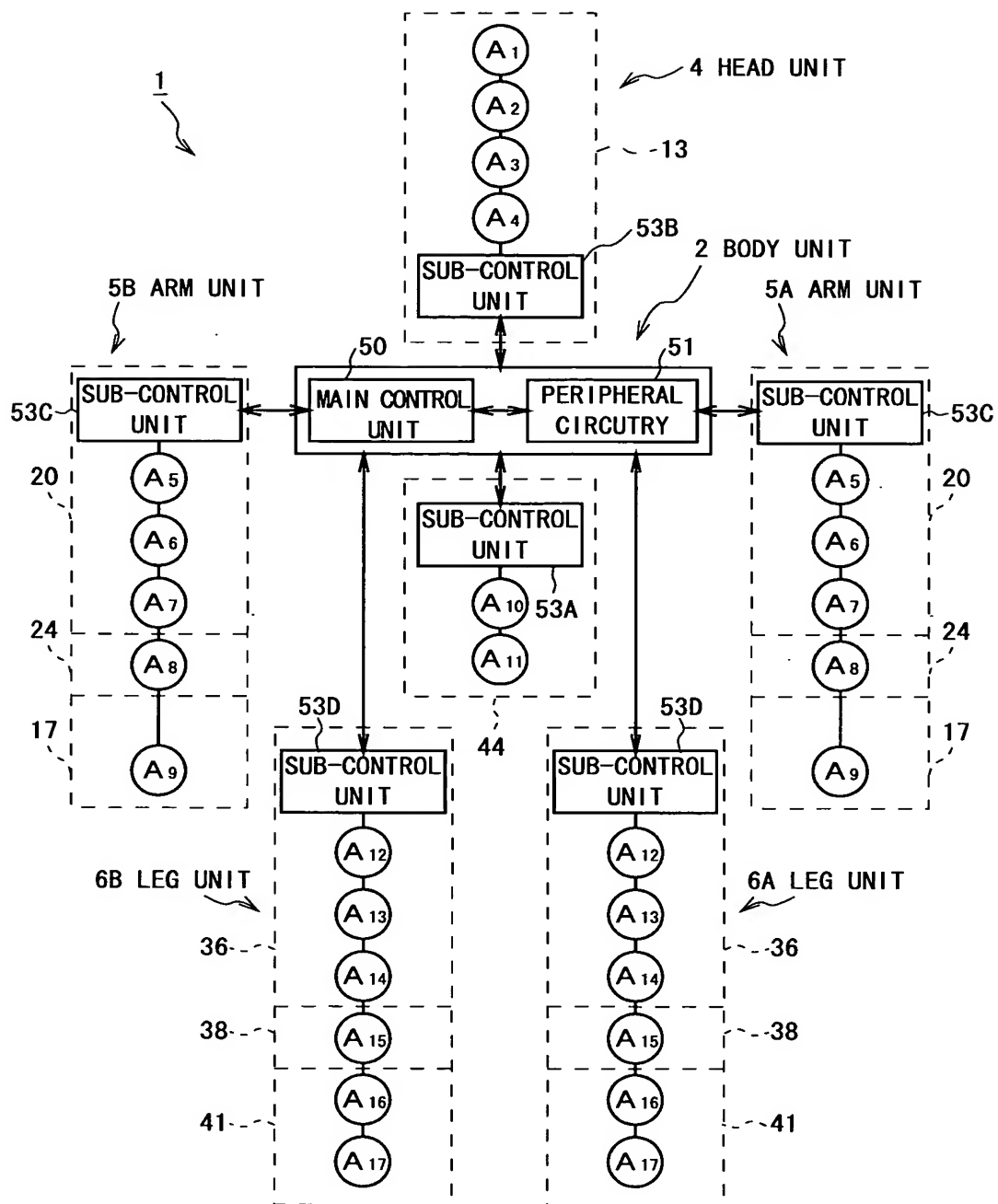


FIG. 4

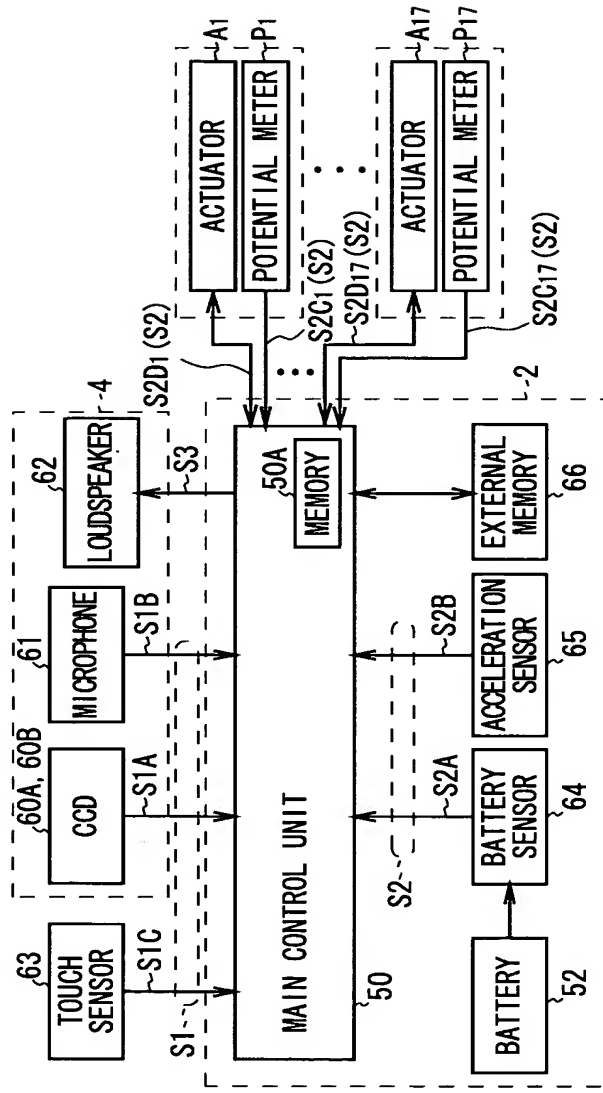


FIG. 5

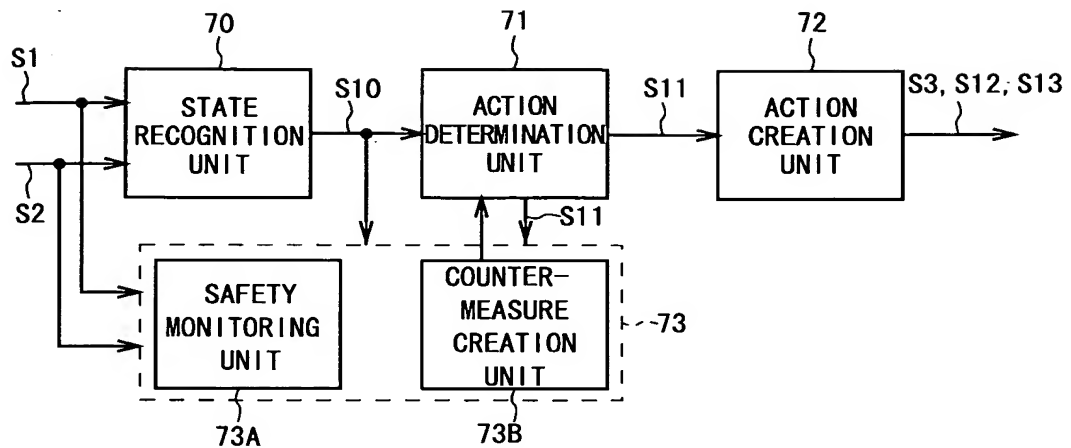


FIG. 6

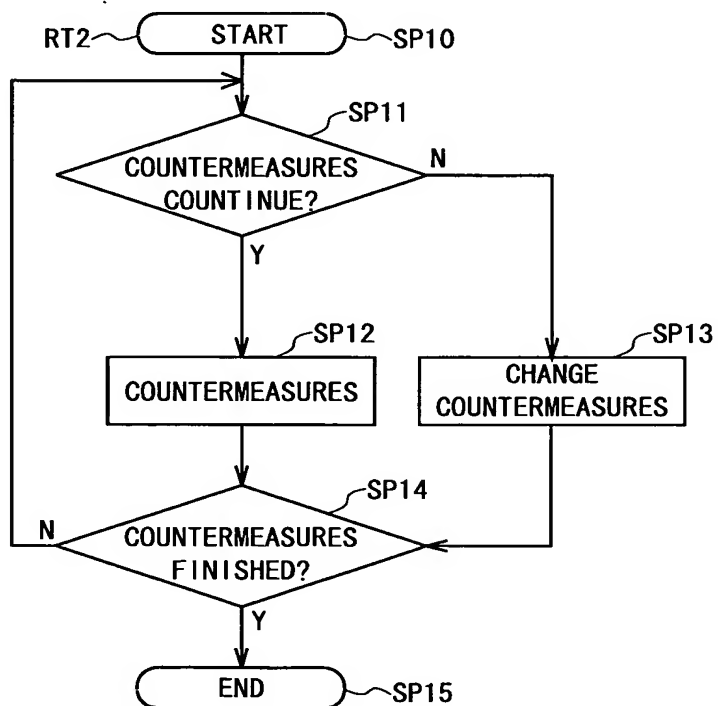


FIG. 11

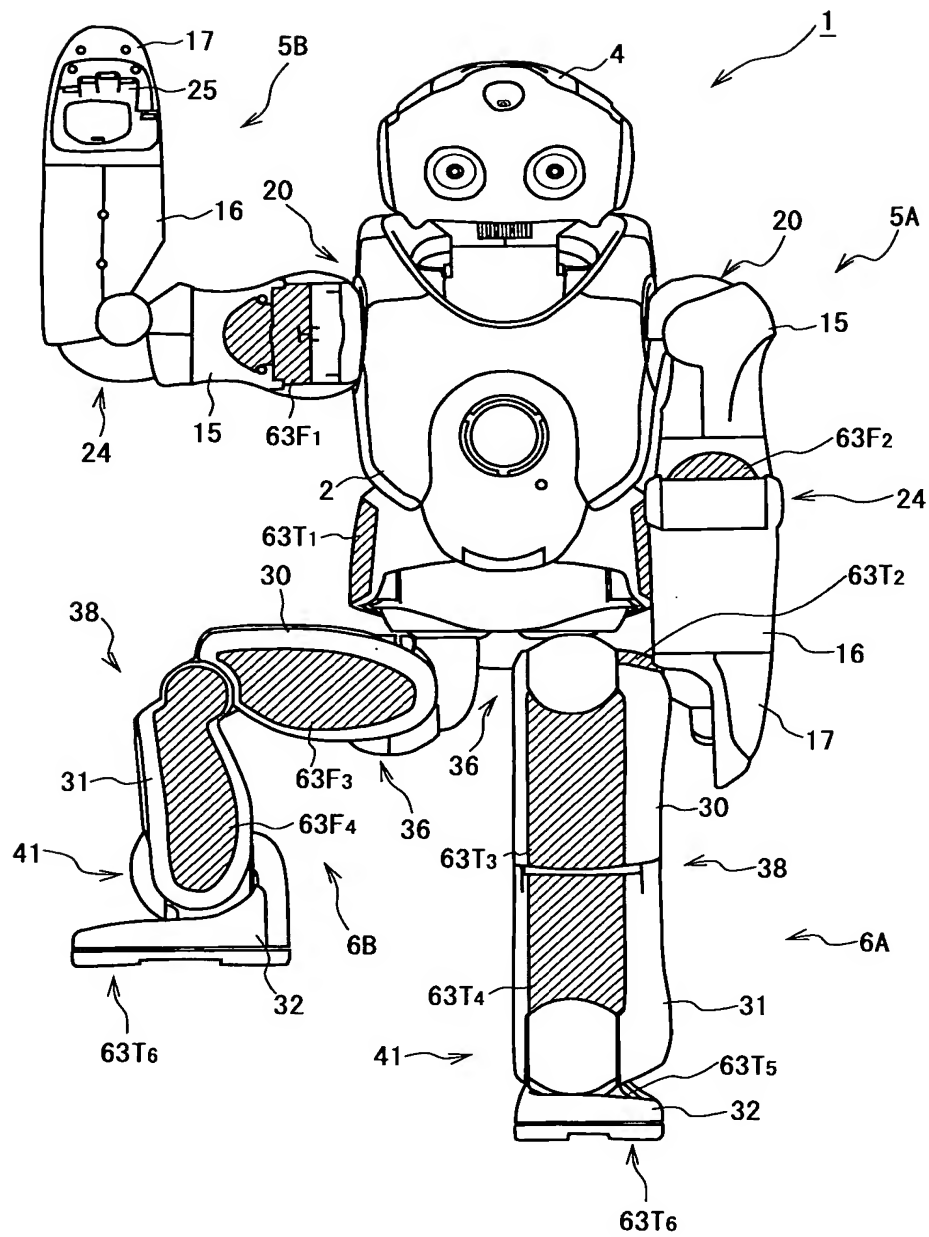


FIG. 7



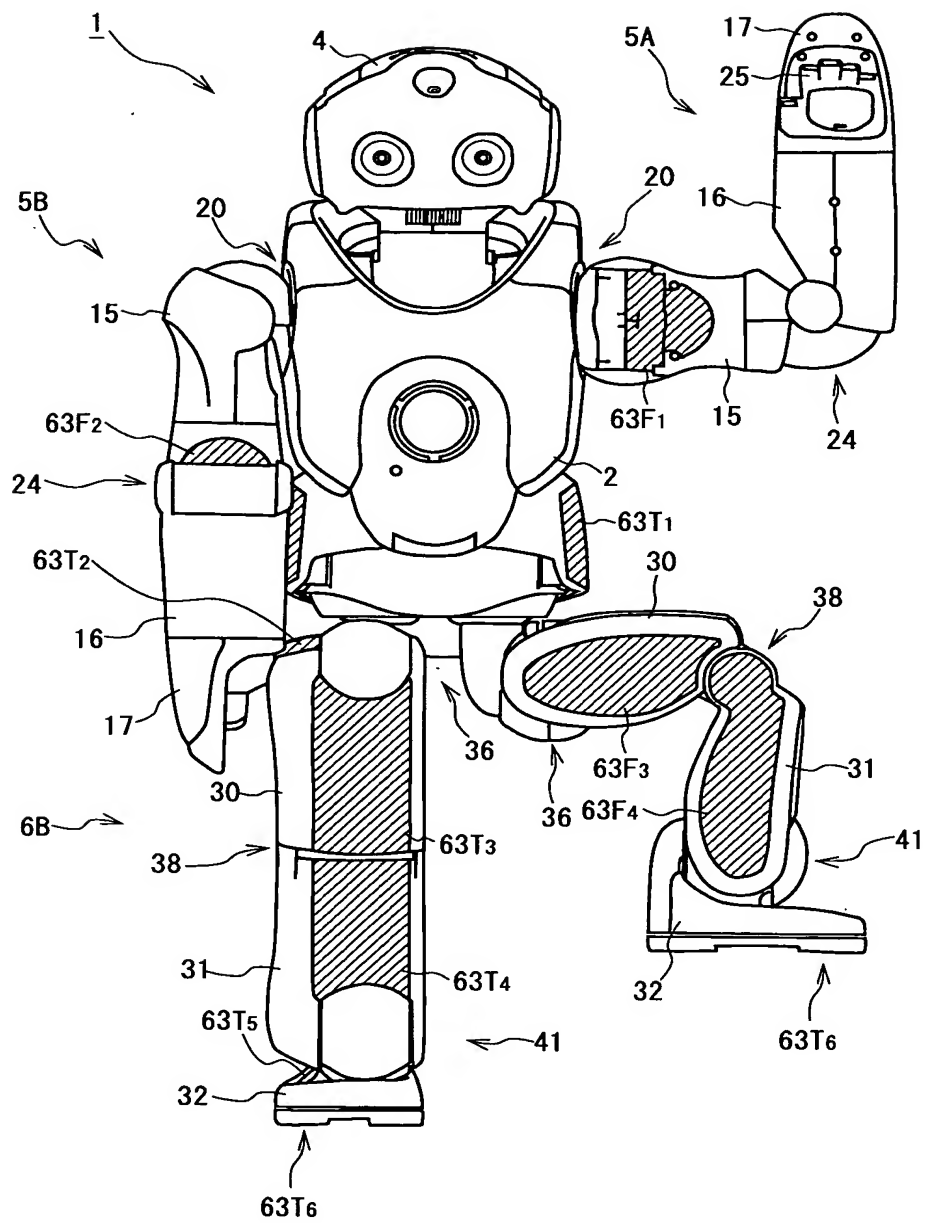


FIG. 8

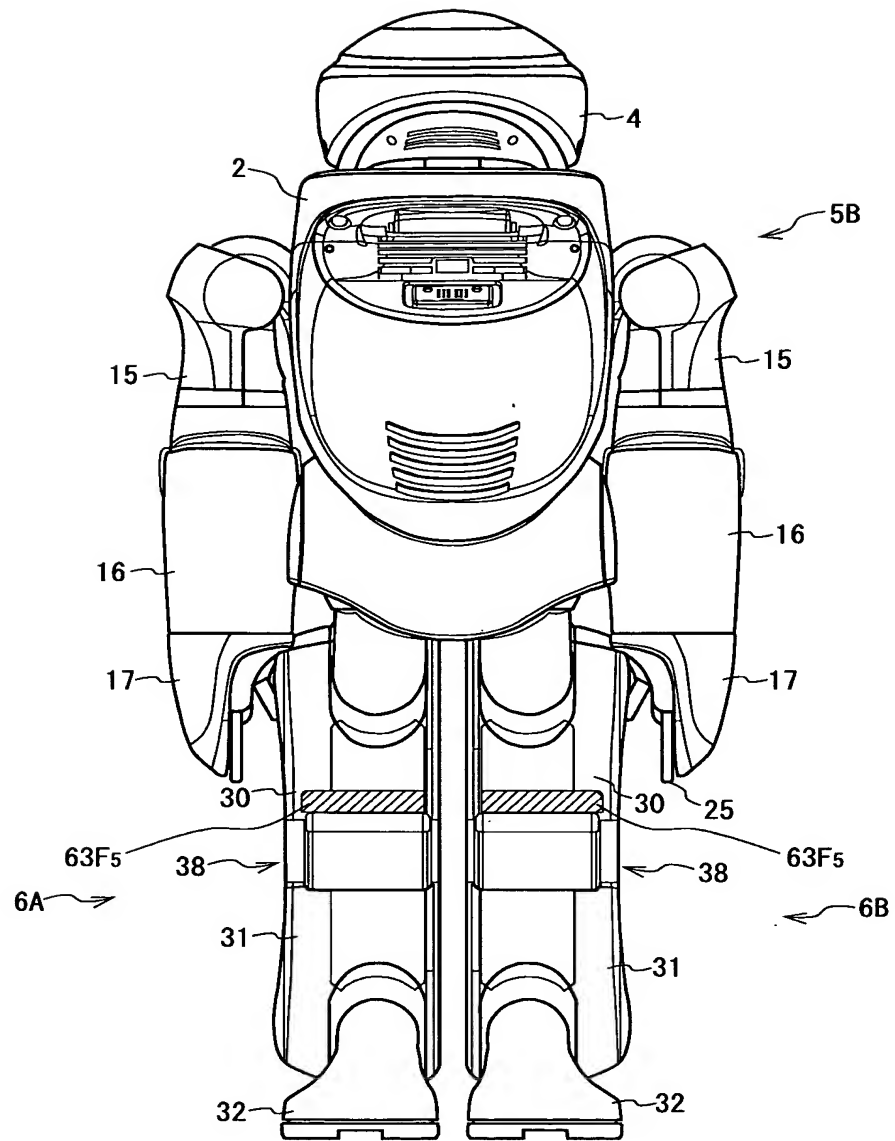


FIG. 9

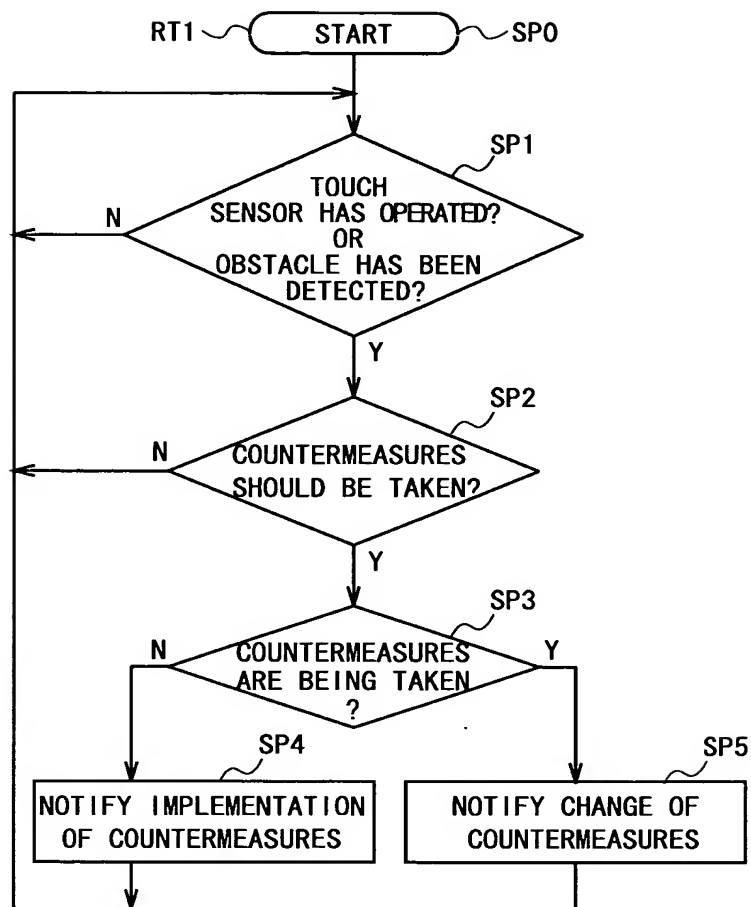


FIG. 10

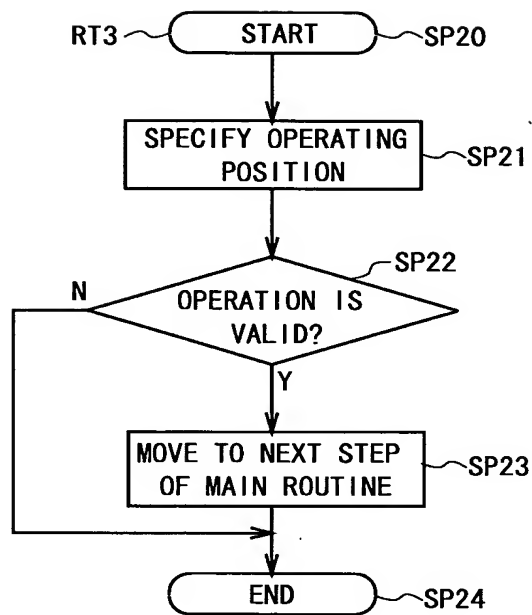


FIG. 12

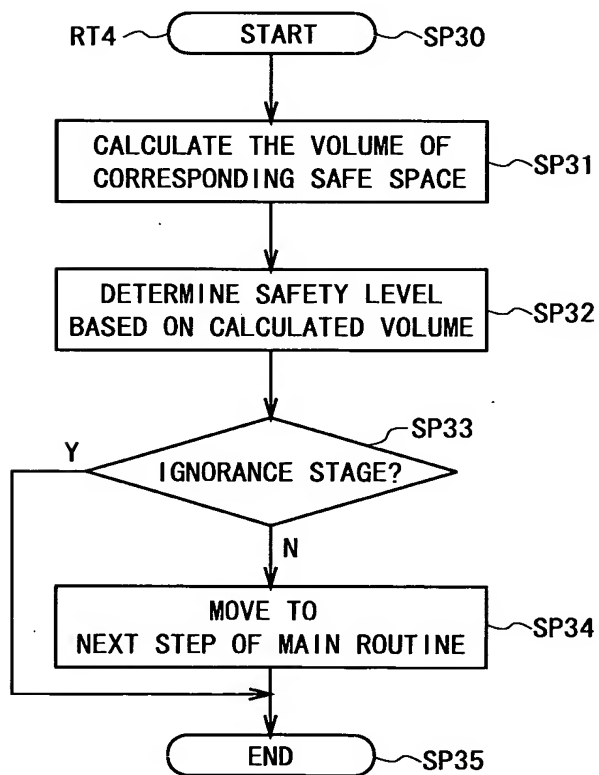


FIG. 13

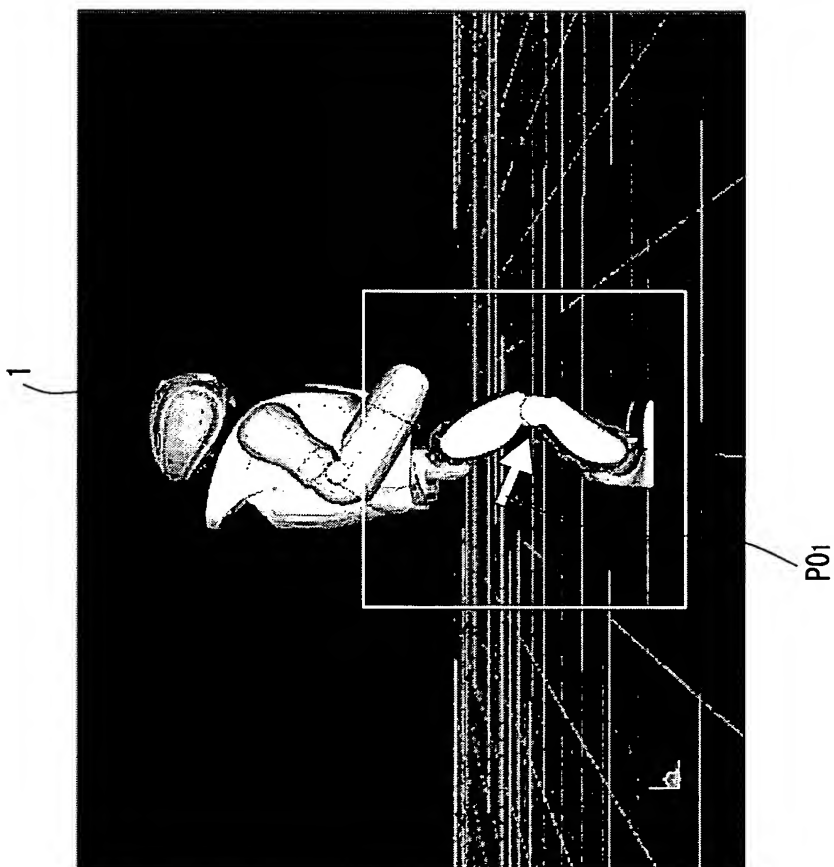


FIG. 14

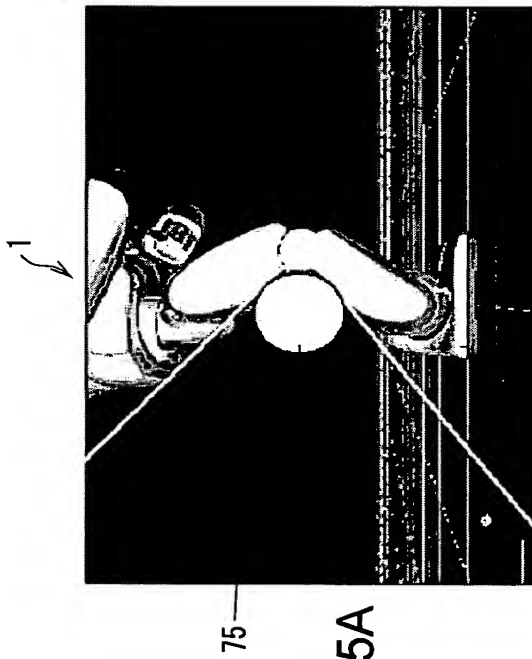


FIG. 15A

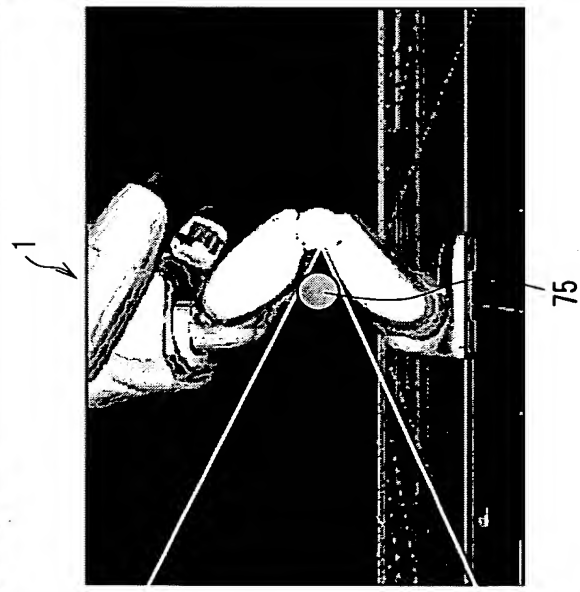


FIG. 15B

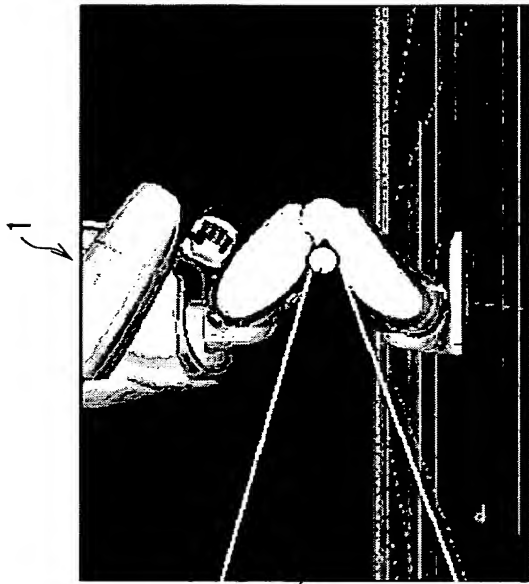


FIG. 15C

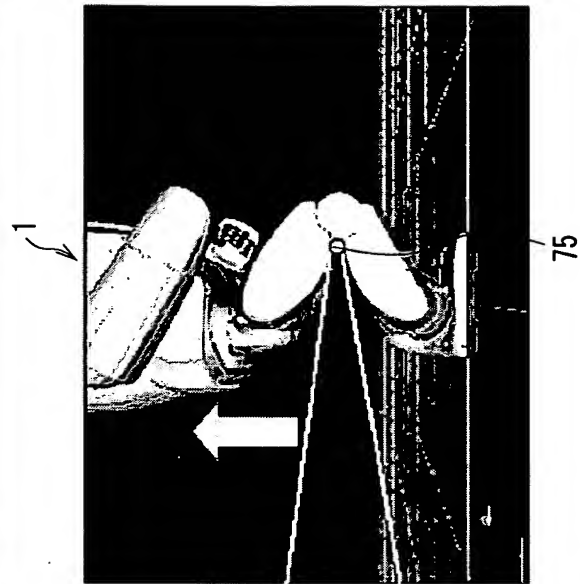


FIG. 15D

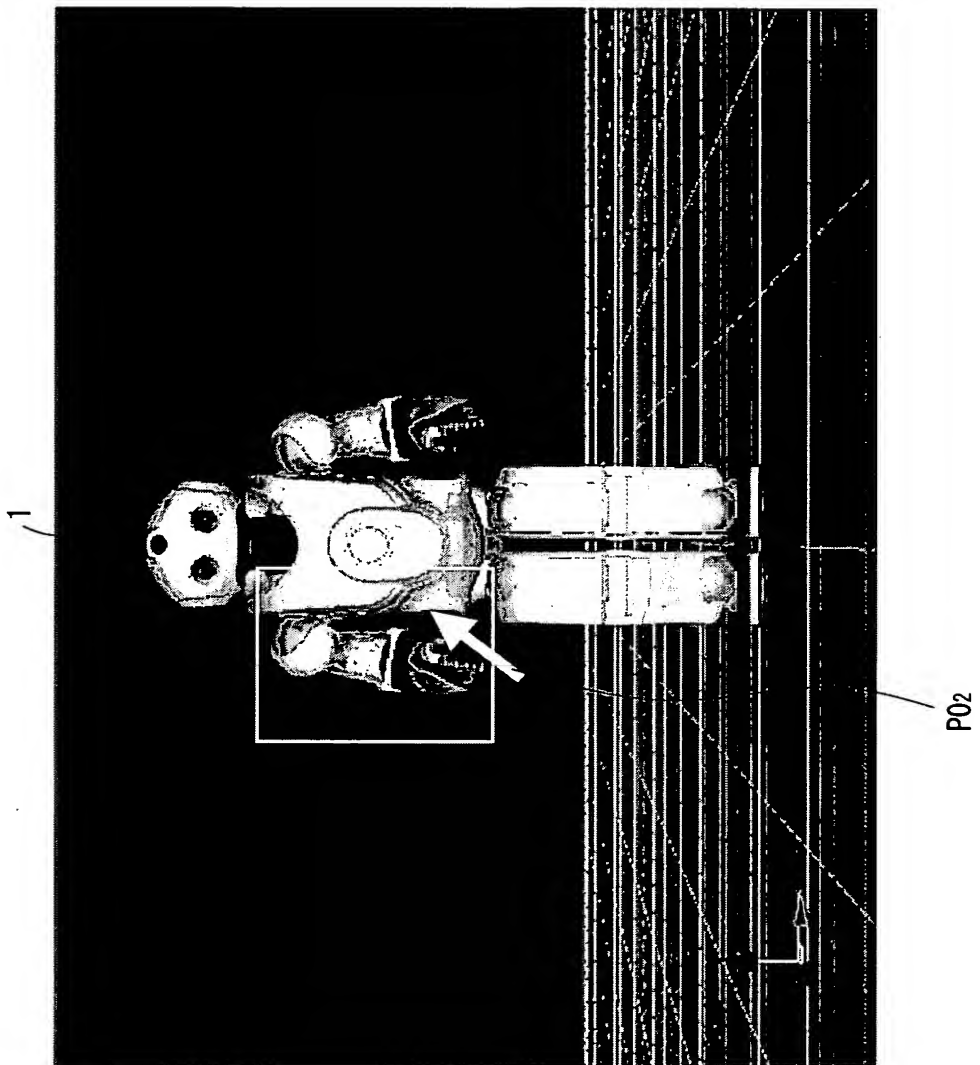


FIG. 16

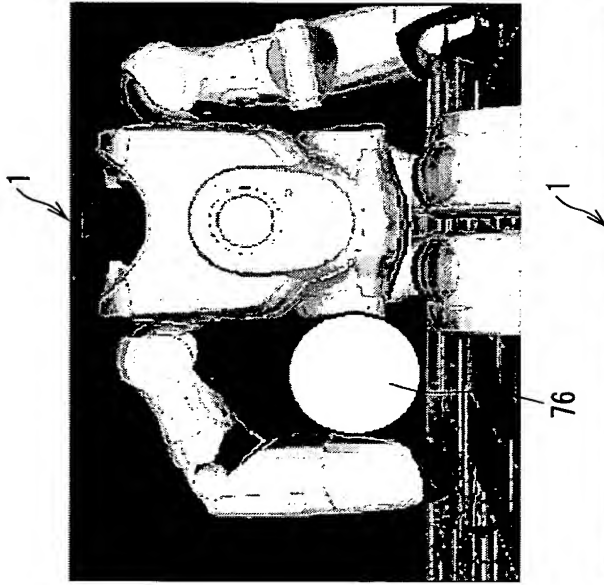


FIG. 17A

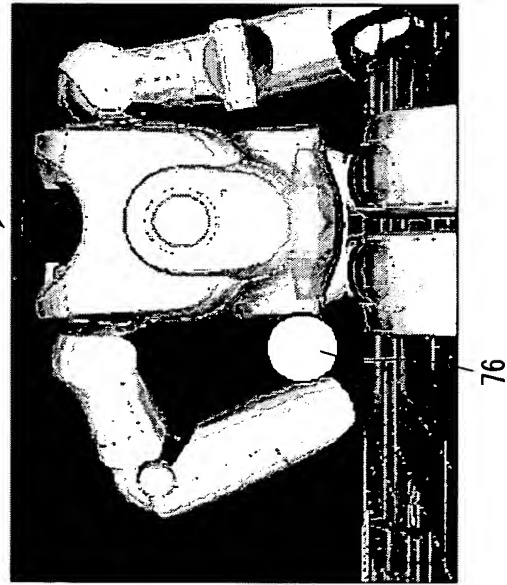


FIG. 17B

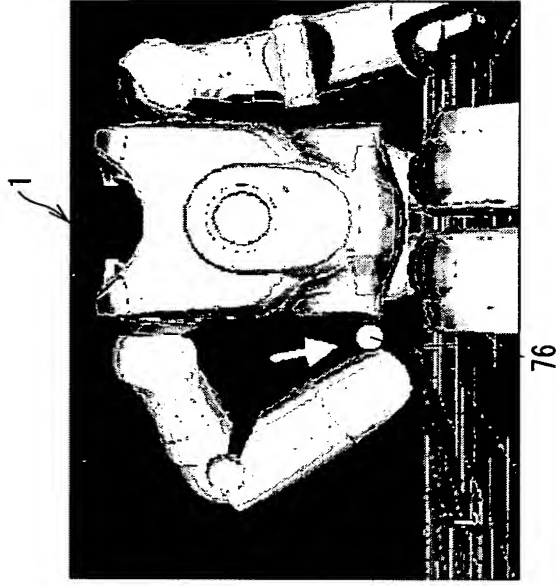


FIG. 17C



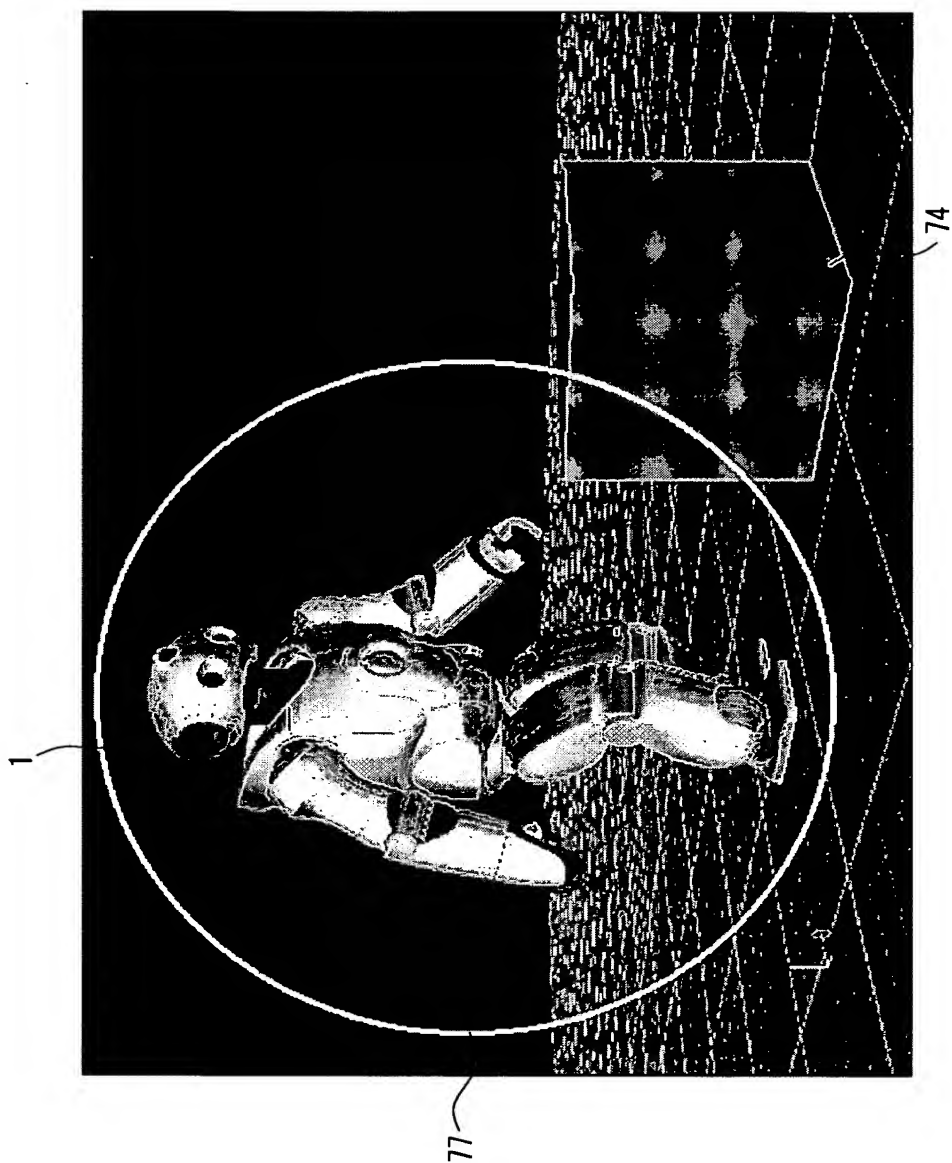


FIG. 18

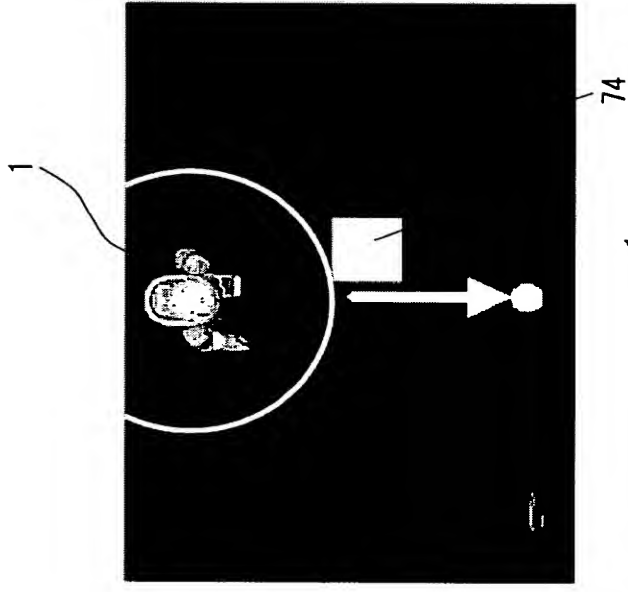


FIG. 19A

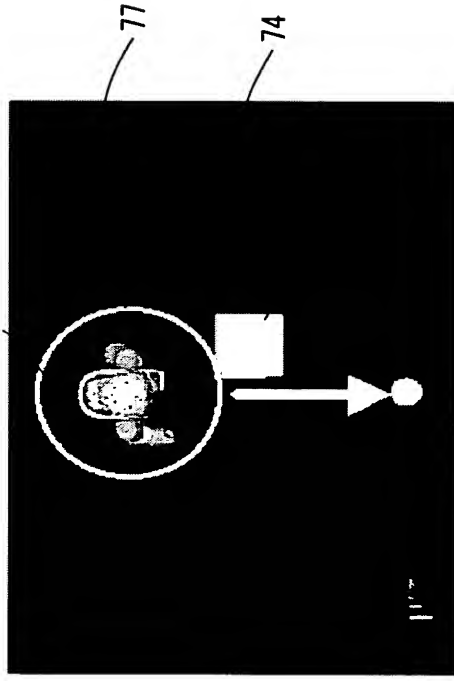


FIG. 19B

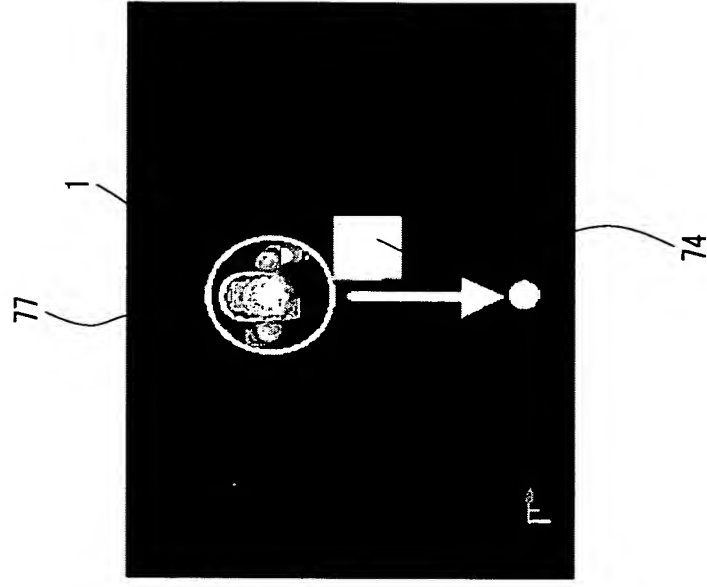


FIG. 19C

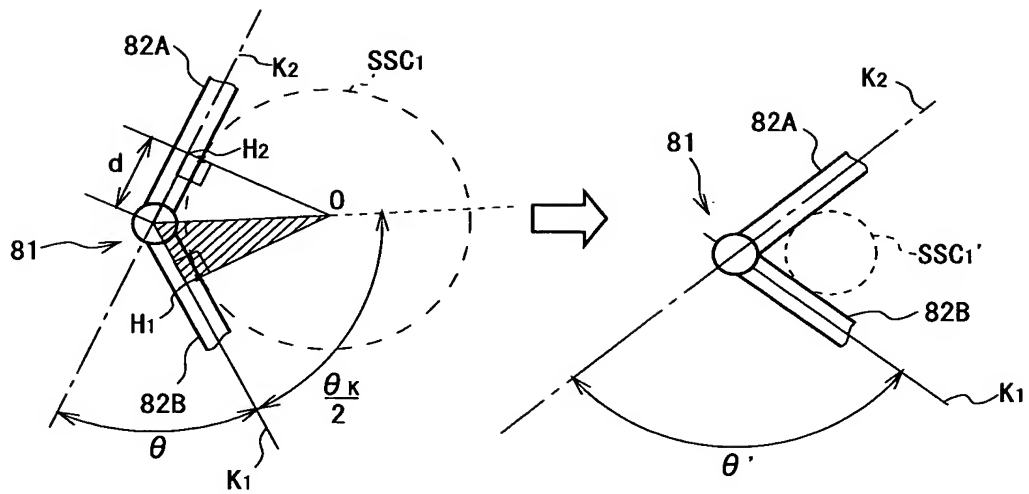


FIG. 20

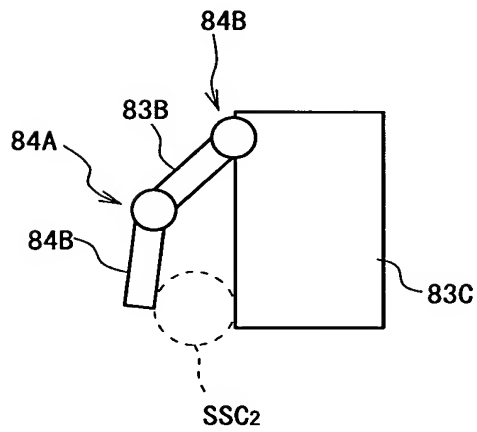


FIG. 21A

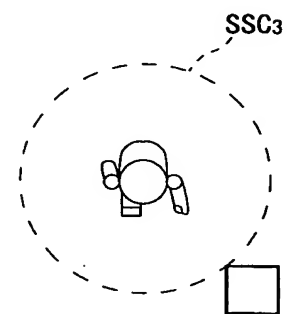


FIG. 21B

SINGLE JOINT

SPACE	SENSOR	POSITION OF SENSOR	RELEVANT JOINT	THRESHOLD VALUE 1	THRESHOLD VALUE 2	THRESHOLD VALUE 3	EMERGENCY PREVENTION AMOUNT	COUNTERMEASURE TYPE
SPACE ON THE OUTSIDE OF LEFT HIP	TACT SWITCH 1	OUTSIDE OF LEFT HIP	ROLL AXIS OF LEFT HIP	m <sub>1</sub> (s <sub>i</sub> )	n <sub>1</sub> (s <sub>i</sub> )	—	—	TABLE 2
SPACE ON THE OUTSIDE OF RIGHT HIP	TACT SWITCH 2	OUTSIDE OF RIGHT HIP	ROLL AXIS OF RIGHT HIP	m <sub>2</sub> (s <sub>i</sub> )	n <sub>2</sub> (s <sub>i</sub> )	—	—	TABLE 2
SPACE AT THE BACK OF LEFT KNEE	SURFACE CONTACT SWITCH 1	BACK OF LEFT KNEE	LEFT KNEE (PITCH AXIS)	m <sub>3</sub> (s <sub>i</sub> )	n <sub>3</sub> (s <sub>i</sub> )	∅ 1(s <sub>i</sub> )	p <sub>1</sub> (s <sub>i</sub> )	TABLE 2
SPACE AT THE BACK OF RIGHT KNEE	SURFACE CONTACT SWITCH 2	BACK OF RIGHT KNEE	RIGHT KNEE (PITCH AXIS)	m <sub>4</sub> (s <sub>i</sub> )	n <sub>4</sub> (s <sub>i</sub> )	∅ 2(s <sub>i</sub> )	p <sub>2</sub> (s <sub>i</sub> )	TABLE 2
SPACE FORMED BY LEFT SHIN AND LEFT INSTEP	TACT SWITCH 3	LEFT SHIN	PITCH AXIS OF LEFT ANKLE	m <sub>5</sub> (s <sub>i</sub> )	n <sub>5</sub> (s <sub>i</sub> )	—	—	TABLE 2
SPACE FORMED BY RIGHT SHIN AND RIGHT INSTEP	TACT SWITCH 4	RIGHT SHIN	PITCH AXIS OF RIGHT ANKLE	m <sub>6</sub> (s <sub>i</sub> )	n <sub>6</sub> (s <sub>i</sub> )	—	—	TABLE 2
SPACE ON THE OUTSIDE OF LEFT ANKLE	TACT SWITCH 5	OUTSIDE OF LEFT ANKLE	ROLL AXIS OF LEFT ANKLE	m <sub>7</sub> (s <sub>i</sub> )	n <sub>7</sub> (s <sub>i</sub> )	—	—	TABLE 2
SPACE ON THE OUTSIDE OF RIGHT ANKLE	TACT SWITCH 6	OUTSIDE OF RIGHT ANKLE	ROLL AXIS OF RIGHT ANKLE	m <sub>8</sub> (s <sub>i</sub> )	n <sub>8</sub> (s <sub>i</sub> )	—	—	TABLE 2
SPACE UNDER LEFT ARMPIT	SURFACE CONTACT SWITCH 3	LEFT ARMPIT	ROLL AXIS OF LEFT SHOULDER	m <sub>9</sub> (s <sub>i</sub> )	n <sub>9</sub> (s <sub>i</sub> )	—	—	TABLE 1
SPACE UNDER RIGHT ARMPIT	SURFACE CONTACT SWITCH 4	RIGHT ARMPIT	ROLL AXIS OF RIGHT SHOULDER	m <sub>10</sub> (s <sub>i</sub> )	n <sub>10</sub> (s <sub>i</sub> )	—	—	TABLE 1
SPACE FORMED BY LEFT UPPER ARM AND LEFT FOREARM	SURFACE CONTACT SWITCH 5	LEFT ELBOW (PITCH AXIS)	LEFT ELBOW (PITCH AXIS)	m <sub>11</sub> (s <sub>i</sub> )	n <sub>11</sub> (s <sub>i</sub> )	—	—	TABLE 1
SPACE FORMED BY RIGHT UPPER ARM AND RIGHT FOREARM	SURFACE CONTACT SWITCH 6	RIGHT ELBOW (PITCH AXIS)	RIGHT ELBOW (PITCH AXIS)	m <sub>12</sub> (s <sub>i</sub> )	n <sub>12</sub> (s <sub>i</sub> )	—	—	TABLE 1

FIG. 22

PLURAL LINKS

SPACE	SENSOR	POSITION OF SENSOR	RELEVANT JOINT	THRESHOLD VALUE 1	THRESHOLD VALUE 2	THRESHOLD VALUE 3	EMERGENCY PREVENTION AMOUNT	COUNTERMEASURE TYPE
SPACE ON THE INSIDE OF LEGS ABOVE KNEE	SURFACE CONTACT SWITCH 7 SURFACE CONTACT SWITCH 8	OUTSIDE OF LEFT HIP OUTSIDE OF RIGHT HIP	YAW AXIS OF LEFT HIP ROLL AXIS OF LEFT HIP YAW AXIS OF RIGHT HIP ROLL AXIS OF RIGHT HIP	m13(Si)	n13(Si)	—	—	TABLE 2
SPACE ON THE INSIDE OF LEGS UNDER KNEE	SURFACE CONTACT SWITCH 9 SURFACE CONTACT SWITCH 10	INSIDE OF LEFT SHIN INSIDE OF RIGHT SHIN	ROLL AXIS OF LEFT HIP ROLL AXIS OF RIGHT HIP	m14(Si)	n14(Si)	—	—	TABLE 2
SPACE FORMED BY FRONT OF LEFT THIGH AND BODY	TACT SWITCH 7	FRONT OF LEFT THIGH	PITCH AXIS OF LEFT HIP PITCH AXIS OF BODY	m15(Si)	n15(Si)	—	—	TABLE 2
SPACE FORMED BY FRONT OF RIGHT THIGH AND BODY	TACT SWITCH 8	FRONT OF RIGHT THIGH	PITCH AXIS OF RIGHT HIP PITCH AXIS OF BODY	m16(Si)	n16(Si)	—	—	TABLE 2
SPACE FORMED BY LEFT FOREARM AND BODY	TACT SWITCH 9	LEFT SIDE OF WAIST	ROLL AXIS OF LEFT SHOULDER PITCH AXIS OF BODY	m17(Si)	n17(Si)	—	—	TABLE 2
SPACE FORMED BY RIGHT FOREARM AND BODY	TACT SWITCH 10	RIGHT SIDE OF WAIST	ROLL AXIS OF RIGHT SHOULDER PITCH AXIS OF BODY	m18(Si)	n18(Si)	—	—	TABLE 2

FIG. 23

# SURROUNDINGS

SPACE	SENSOR	POSITION OF SENSOR	RELEVANT JOINT	THRE- SHOLD VALUE 1	THRE- SHOLD VALUE 2	THRE- SHOLD VALUE 3	EMERGENCY PREVENTION AMOUNT	COUNTER- MEASURE TYPE
SPACE FORMED BY BODY AND SURROUNDING OBSTACLE	CCD	HEAD UNIT	—	m <sub>19</sub> (Si)	n <sub>19</sub> (Si)	l <sub>3</sub> (Si)	p <sub>3</sub>	TABLE 3

87

FIG. 24

# SINGLE JOINT

SPACE	THRESHOLD VALUE 1	THRESHOLD VALUE 2	THRESHOLD VALUE 3	EMERGENCY PREVENTION AMOUNT
SPACE ON THE OUTSIDE OF LEFT HIP	15	10	—	—
SPACE ON THE OUTSIDE OF RIGHT HIP	15	10	—	—
SPACE AT THE BACK OF LEFT KNEE	20	15	12	12
SPACE AT THE BACK OF RIGHT KNEE	20	15	12	12
SPACE FORMED BY LEFT SHIN AND LEFT INSTEP	25	20	—	—
SPACE FORMED BY RIGHT SHIN AND RIGHT INSTEP	25	20	—	—
SPACE ON THE OUTSIDE OF LEFT ANKLE	37	32	—	—
SPACE ON THE OUTSIDE OF RIGHT ANKLE	37	32	—	—
SPACE UNDER LEFT ARMPIT	35	25	—	—
SPACE UNDER RIGHT ARMPIT	35	25	—	—
SPACE FORMED BY LEFT UPPER ARM AND LEFT FOREARM	40	30	—	—
SPACE FORMED BY RIGHT UPPER ARM AND RIGHT FOREARM	40	30	—	—

FIG. 25A

PLURAL LINKS

SPACE	THRESHOLD VALUE 1	THRESHOLD VALUE 2	THRESHOLD VALUE 3	EMERGENCY PREVENTION AMOUNT
SPACE ON THE INSIDE OF LEG ABOVE KNEE	50	30	—	—
SPACE ON THE INSIDE OF LEG UNDER KNEE	20	10	—	—
SPACE FORMED BY FRONT OF LEFT THIGH AND BODY	40	25	—	—
SPACE FORMED BY FRONT OF RIGHT THIGH AND BODY	40	25	—	—

FIG. 25B

SURROUNDINGS

SPACE	THRESHOLD VALUE 1	THRESHOLD VALUE 2	THRESHOLD VALUE 3	EMERGENCY PREVENTION AMOUNT
SPACE FORMED BY BODY AND SURROUNDING OBSTACLE	70	20	10	10

FIG. 25C

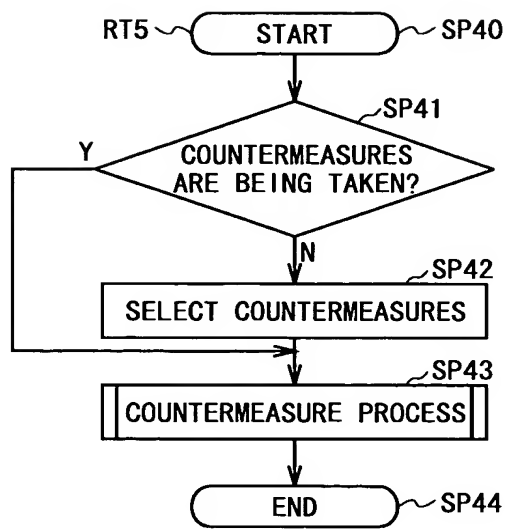


FIG. 26



BODY CONDITIONS	IGNORANCE STAGE	WARNING STAGE	EMERGENT STAGE	EMERGENCY PREVENTION STAGE
STANDING (S1)	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION (SO AS TO RESUME ACTION EASILY) CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	—
MOVING ON FLOOR (S2)	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION (SO AS TO RESUME ACTION EASILY) CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	—
ON STATION (S3)	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION (SO AS TO RESUME ACTION EASILY) CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	—
LIFTED (S4)	—	—	—	—
RECOVERING (S5)	CONTINUE RECOVERING ACTION	—	IMMEDIATE STOP	—

FIG. 27

BODY CONDITIONS	IGNORANCE STAGE	WARNING STAGE	EMERGENT STAGE	EMERGENCY PREVENTION STAGE
STANDING (S <sub>1</sub> )	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION (SO AS TO RESUME ACTION EASILY)	IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION	EXPAND SAFE SPACE IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT
MOVING ON FLOOR (S <sub>2</sub> )	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION (SO AS TO RESUME ACTION EASILY)	IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT	EXPAND SAFE SPACE IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION CAUSE WEAKNESS IN ALL JOINTS (SINGLE ARM UNIT) OF LINKS ATTACHED TO THE JOINT
ON STATION (S <sub>3</sub> )	CONTINUE CURRENT ACTION	—	—	—
LIFTED (S <sub>4</sub> )	—	—	—	—
RECOVERING (S <sub>5</sub> )	CONTINUE RECOVERING ACTION	IMMEDIATE STOP	IMMEDIATE STOP	—

FIG. 28

BODY CONDITIONS	IGNORANCE STAGE	WARNING STAGE	EMERGENT STAGE	EMERGENCY PREVENTION STAGE
STANDING (S1)	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION (SO AS TO RESUME ACTION EASILY)	IMMEDIATELY STOPWHOLE BODY DO NOT CONSIDER BODY PROTECTION	EXPAND SAFE SPACE → FALL IS SELECTABLE IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTIONZ
MOVING ON FLOOR (S2)	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION(SO AS TO RESUME ACTION EASILY)	IMMEDIATELY STOPWHOLE BODY DO NOT CONSIDER BODY PROTECTION	EXPAND SAFE SPACE → FALL IS SELECTABLE IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTIONZ
ON STATION (S3)	CONTINUE CURRENT ACTION	GRADUALLY STOP CURRENT ACTION CONSIDER BODY PROTECTION(SO AS TO RESUME ACTION EASILY)	IMMEDIATELY STOPWHOLE BODY DO NOT CONSIDER BODY PROTECTION	EXPAND SAFE SPACE IMMEDIATELY STOP WHOLE BODY DO NOT CONSIDER BODY PROTECTION
LIFTED (S4)	—	—	—	—
RECOVERING (S5)	CONTINUE RECOVERING ACTION	—	IMMEDIATE STOP	—

FIG. 29

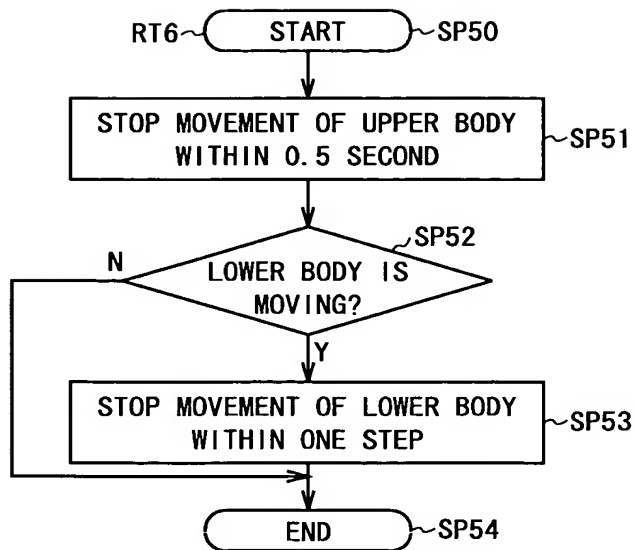


FIG. 30

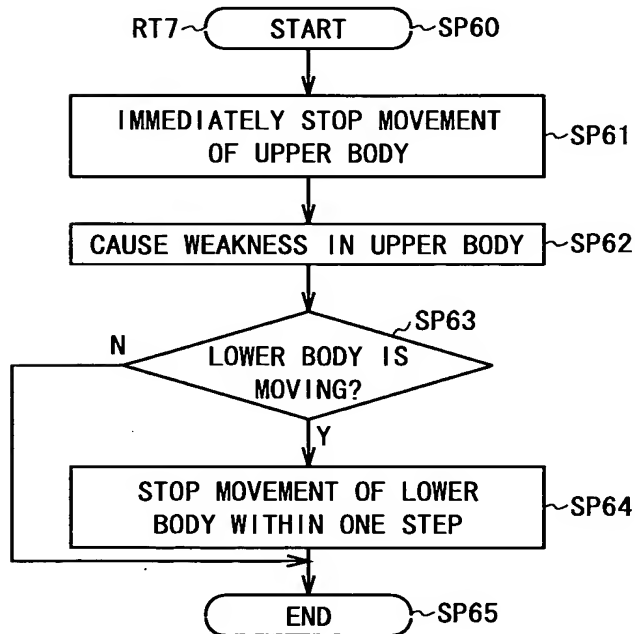


FIG. 31

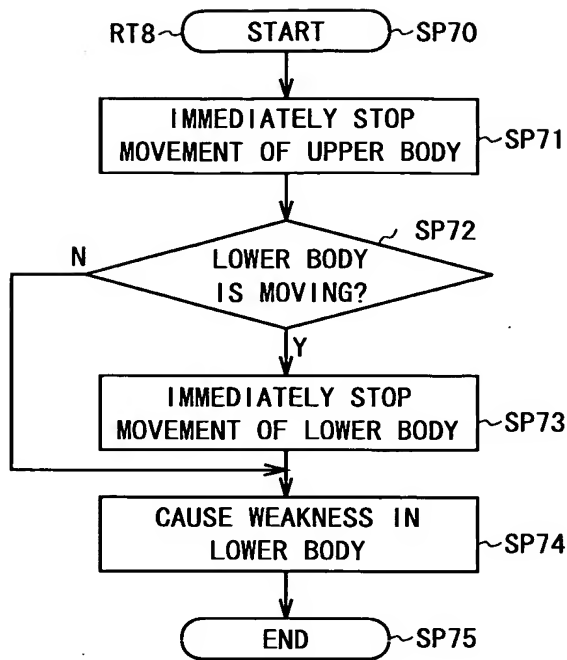


FIG. 32

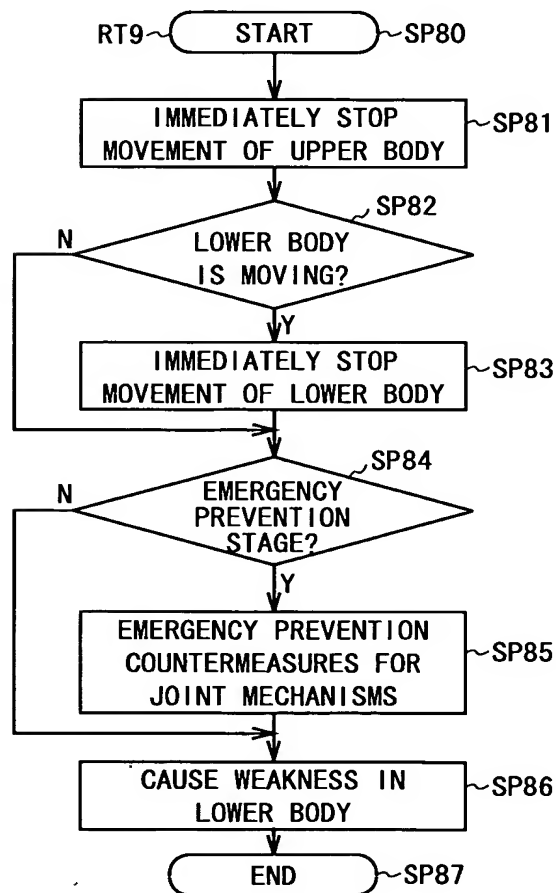


FIG. 33

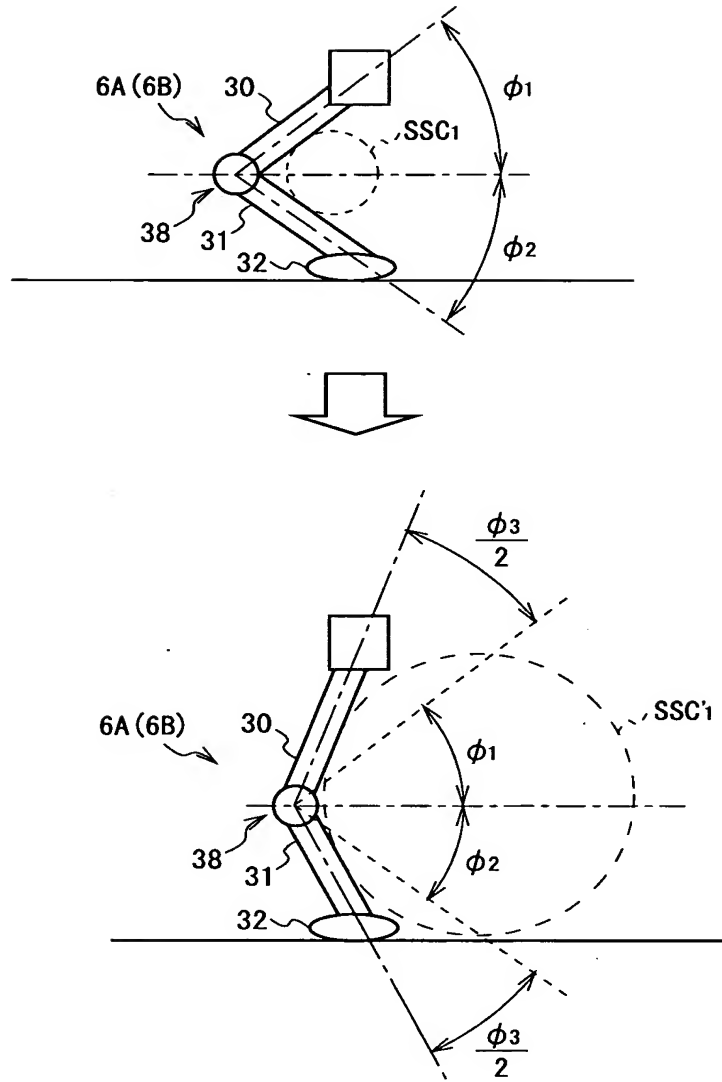


FIG. 34

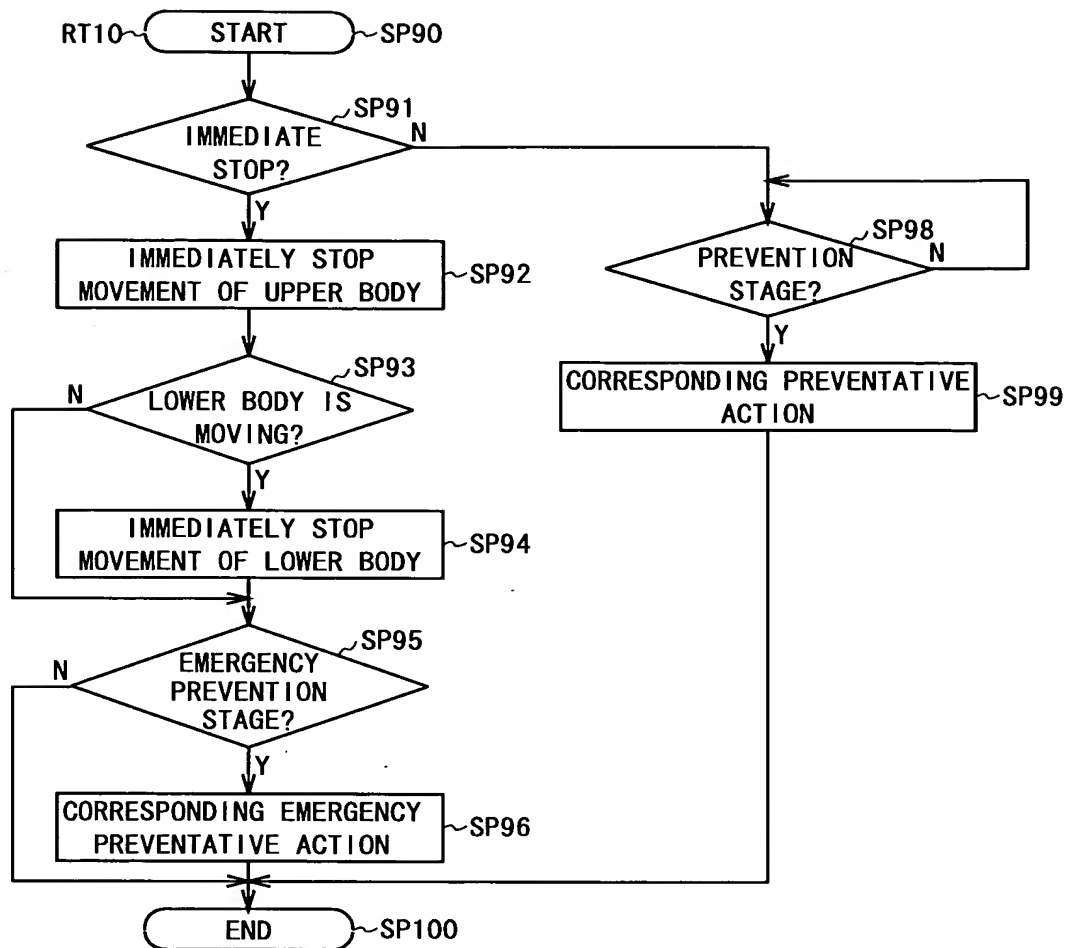


FIG. 35

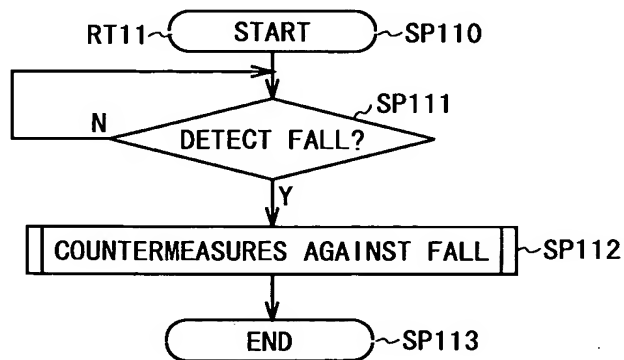


FIG. 41

FIG. 36A

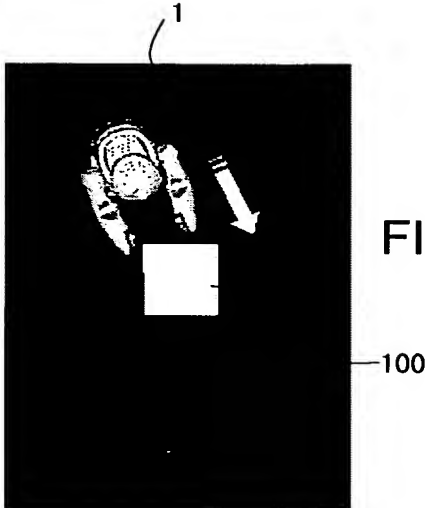


FIG. 36B

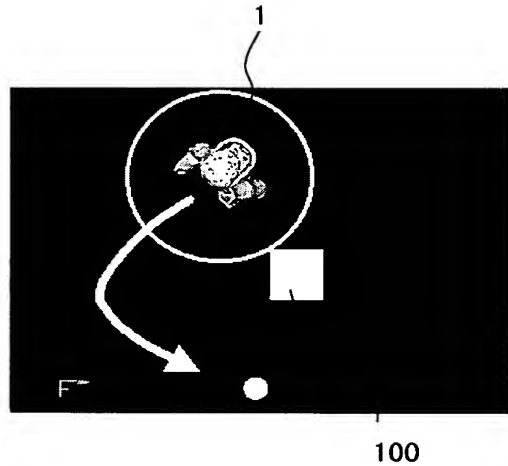
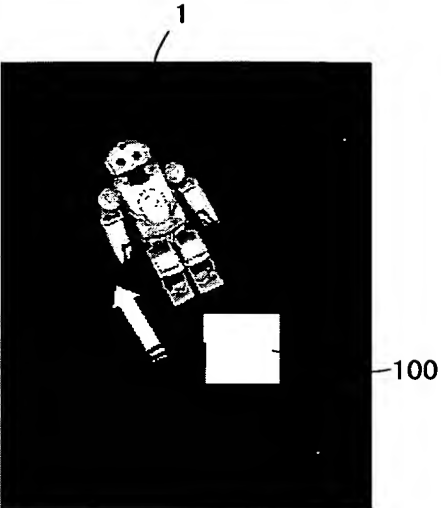


FIG. 37A

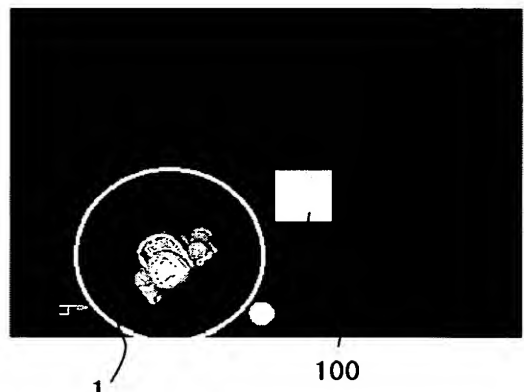


FIG. 37B



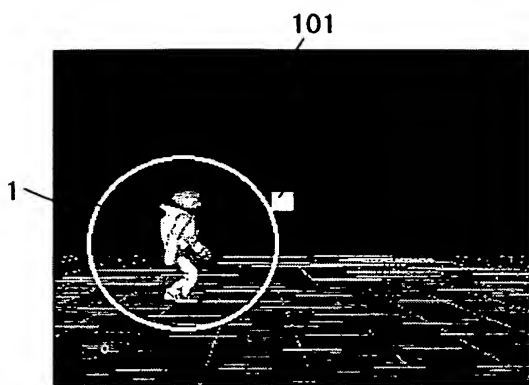


FIG. 38A

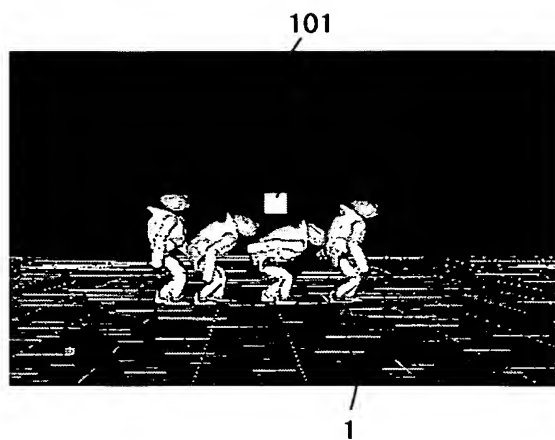


FIG. 38B

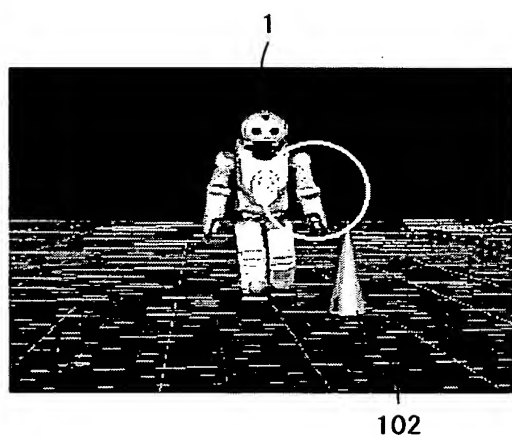


FIG. 39A

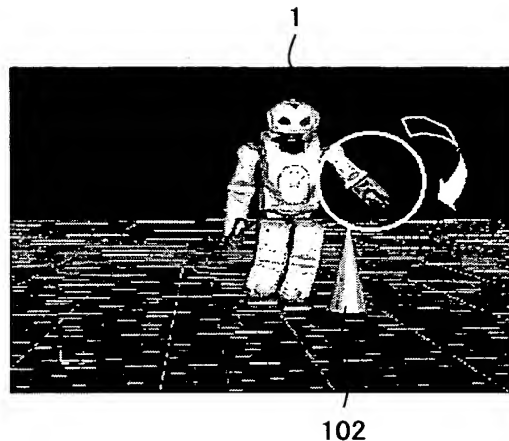


FIG. 39B

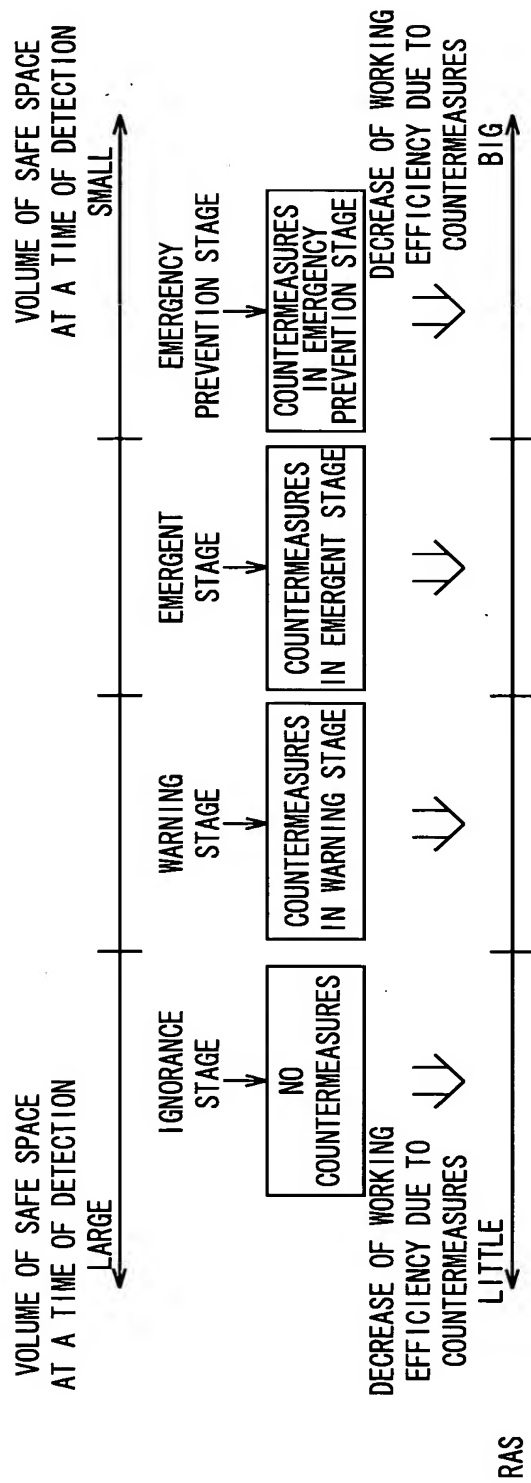


FIG. 40

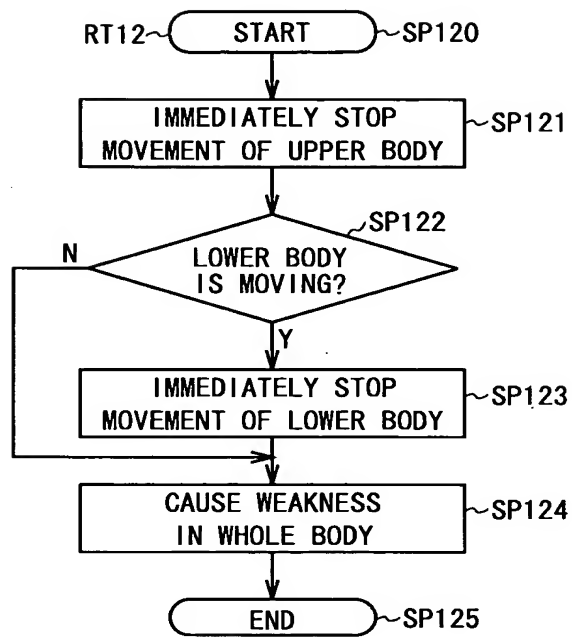


FIG. 42

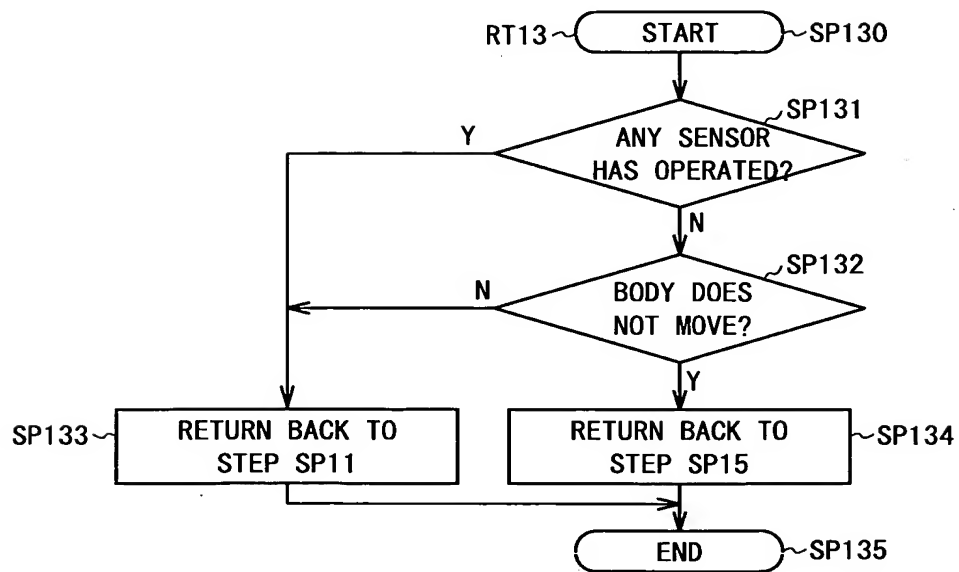


FIG. 43